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SCIENCE.

FRIDAY, DECEMBER 11, 1885.

COMMENT AND CRITICISM.

THE STATEMENT that one of the chief applications of composite photography will be in the direction of producing more reliable portraits of representative men by combining the testimonials of individual artists, will probably be accepted by all who have followed the short but interesting career of this new invention. The suggestion that, by combining the individual conceptions of several artists, one would obtain a more reliable portrait than any of the components, was near at hand. The first such application was made by Mr. Galton himself. He made a composite of six medallion heads of Alexander the Great, and naturally claimed for the composite the combined authority of all the artists; for it is evident, that, while each artist will very likely express the general features of his subject, some peculiar idiosyncrasies of his own are apt to creep in. The composite sifts out all these common traits, and presents them strong and clear, while it reduces each artist's peculiarity to a scarcely perceptible shadow.

In this way we have recently come into possession of a new Shakspeare, for which we have to thank Mr. Walter Rogers Furness. In the case of Shakspeare the diversity amongst the several originals is strikingly evident, and thus a composite was needed to give a characteristic, individual, natural face. This suggested to Mr. W. C. Taylor the application of the same process to Washington's portraits. He has grouped the several portraits into three groups, owing to the differences of position of the portraits, and the accuracy of the work is well shown by the fact that the agreement amongst the resulting three composites is very close, while the originals show every shade of individual differences. These portraits were first published in the *Journal of the Franklin institute*, and are given on a new and enlarged plate in this number. The lower right-hand composite has seemed to many the happiest result, and seems likely to serve as the model for future portraits of Washington.

PRESIDENT CLEVELAND, in his annual message to congress, referred to several matters of interest to scientific men. Of the coast survey he says: "It was many years ago sanctioned, apparently for a purpose regarded as temporary, and related to a survey of our coast. Having gained a place in the appropriations made by congress, it has gradually taken to itself powers and objects not contemplated in its creation, and extended its operations until it sadly needs legislative attention. So far as a further survey of our coast is concerned, there seems to be a propriety in transferring that work to the navy department. The other duties now in charge of this establishment, if they cannot be profitably attached to some existing department or other bureau, should be prosecuted under a law exactly defining their scope and purpose, and with a careful discrimination between the scientific inquiries which may properly be assumed by the government and those which should be undertaken by state authority or by individual enterprise. It is hoped that the report of the congressional committee heretofore appointed to investigate this and other like matters will aid in the accomplishment of proper legislation on this subject." The recommendation to break up the present organization will certainly be received with regret by the well-wishers of the survey. For the signal service the president has suggestions which will be received by many of our readers with more favor. He says: "In view of the fact referred to by the secretary of war, that the work of this service ordinarily is of a scientific nature, and the further fact that it is assuming larger proportions constantly, and becoming more and more unsuited to the fixed rules which must govern the army, I am inclined to agree with him in the opinion that it should be separately established." Of this service, also, the president remarks that the scope of its operations should be definitely prescribed. He seems to fear that the scientific work carried on by the government may get beyond bounds, the nature of which, however, he does not define. At the close of the message the attention of congress is called once more to the need of providing quarters for the library of the capitol, the books of which are now kept in piles.

IT SEEMS PROBABLE that Pasteur will be able by means of observations on human beings to determine the practical value of his method of inoculation for the prevention of hydrophobia. On Dec. 4 six children in Newark were bitten by a dog which was probably rabid. It has been decided to send four of these children to Paris to be treated by Pasteur according to his method. Probably about sixteen or seventeen days will elapse between the reception of the bites and the beginning of the treatment. Regarded as an experiment, the value of the result of this treatment is increased by the fact that two of the children will remain at home, and will probably not be subjected to the treatment. Unfortunately the dog was killed, so that positive proof of its being rabid does not exist.

IT IS not difficult to find much to criticise in Pasteur's experiments on hydrophobia so far as they have been reported. It should, however, be remembered that these experiments have not yet been published in detail, and it is not probable that many points of criticism which readily suggest themselves have escaped so acute and accurate an observer as Pasteur. In fact, the main support of Pasteur's views lies in his established reputation as a cautious and far-seeing experimenter. As has been suggested in previous articles upon this subject in recent numbers of *Science*, it certainly seems a weak point that no micro-organism or characteristic lesion has been discovered by which it can be positively demonstrated that the disease which Pasteur produces in rabbits is hydrophobia. It has even been suggested that the disease of the rabbits is possibly only septicaemia. It will require a large number of observations on human beings before it can be proven that Pasteur's inoculations really prevent the development of hydrophobia. It is to be remembered that not a few of the dogs popularly supposed to be mad, and which are killed for this reason, are not affected with rabies. It is also abundantly established that a considerable proportion of those who are bitten by mad dogs never develop hydrophobia. Of those who are subjected to Pasteur's treatment, the wound has in most cases been already cauterized or excised, and this local treatment may account for the favorable result in some instances. But, notwithstanding all possible objections, there is still sufficient ground for confidence in Pasteur's conclusions to make it a matter of congratulation that the value of his treatment is to be so rapidly

and so fully tested by its application to human beings. It has been recently announced that in one case, in which Pasteur began his treatment thirty-six days after the reception of the bites, the patient has died of hydrophobia. Pasteur attributes the unfavorable result to the long interval which had elapsed between the reception of the bites and the beginning of the treatment.

AT THE PRESENT TIME, when so much is said and written of 'mad dogs,' it may be well to recognize that, as the *Lancet* says, fear or nervous apprehension can induce a fatal disease having nearly, if not all, the characters of hydrophobia. It is not necessarily true that hydrophobia is always brought on by the mental anxiety that a dog-bite not infrequently occasions. Hydrophobia is a nervous disease, but it has probably a material cause, a poison, which is most likely a 'germ' or micro-organism. It is a curious fact that birds, even when inoculated with the poison of rabies, do not suffer from the disease; and some individuals appear to enjoy, with birds, the same kind of immunity. The *Lancet* further points out that whether it is those persons who are not given to fear or nervous apprehension who always escape hydrophobia, even though bitten by a rabid dog, we are not in a position to state. But nothing can be more detrimental to a bitten individual than to brood over his misfortune, or make himself miserable by learning all the symptoms of hydrophobia.

SINCE THE RESEARCHES of Pflüger have shown that the oxidation and reduction processes which are the basis of life take place, not in the blood, but in the tissues, attempts have been made to localize these processes. But up to the present very little progress has been made in this line of study. Prof. P. Ehrlich of Berlin has employed a novel method of studying this question, which consists in injecting colored substances which by reduction become colorless, and after death observing which tissues are colored, and which colorless, and, further, determining which of the colorless tissues become colored by oxidation outside of the body. Those tissues which after death are at first colorless, but which become colored by treatment with an oxidizing agent, were, of course, the seat of reduction within the body. The two colored substances used in most of the experiments were alizarin-blue and indophenol.

The latter is more easily reduced than the former, and when it was used a larger number of tissues were found colorless after death. Those tissues which were colorless when alizarin-blue was used were the seat of the most active reduction during life. The author does not profess to have done more than lay the groundwork for future investigation. The results thus far reached do not enable him to draw any very important conclusions, though his discussion is interesting and highly suggestive.

A NATIONAL UNIVERSITY.

SECRETARY LAMAR recommends in his annual report that a 'national university' be established in Washington. He says that "this national institution, which Washington, Adams, Jefferson, and Madison thought so necessary, has never been established; and in these later years the idea of a national university constitutes no part of the plans of statesmen, and seems to have been lost sight of by the people." This statement is not strictly correct, for it seems that in 1869 Dr. John W. Hoyt of Wisconsin brought before the National teachers' association, meeting that year at Trenton, N.J., a resolution, which was adopted, to the effect, that, in the opinion of that association, "a great American university is a leading want of American education;" and a committee was appointed to mature plans for such a university. This proposition was considered at the meetings of the association in 1870 and 1871, but there is no evidence that the committee ever did any active work.

Notwithstanding this inanition of the project, some action was taken by congress in the spring of 1872, looking to the establishment of such a university, when two bills were brought into the senate. One of these was drawn by Dr. Hoyt, who, although chairman of the committee of the national association, had never been able to get that committee together, and it was therefore essentially a bill presented by a private citizen. Neither bill was supported by anybody in any way; and the senators who introduced them did not imagine for a moment that any legislation would grow out of them.

Secretary Lamar calls attention to the scientific bureaus which "have grown up, one by one, under the government, with observatories, laboratories, museums, and libraries, until the whole range of physical science is represented by national institutions established by the government for the pur-

pose of prosecuting researches, embracing astronomy, meteorology, geography of land and sea, geology, chemistry, statistics, mechanical inventions, etc.," and expresses an opinion, that, if these bureaus "could be combined as integral parts of one scientific institution, such an institution would be of greater proportions and more comprehensive than any other in the world;" and that, "should a university be erected thereon with a superstructure commensurate with the foundation, it would be without a rival in any country." This is a picture of a crowning university, richer, better, and more comprehensive than any existing institution, which may to some be fascinating.

By all these would-be benefactors of American education, many of the difficulties in the way of establishing a national university have been overlooked. In August, 1873, President Eliot of Harvard made a report to the National educational association on the then talked of national university. Although in his report we find little of "democracies having been the cradles of pure thought and art," or of a burning aspiration on the part of the American people for "a higher education,—higher than the common school or academy or college can furnish,"—we do find much of the cool common sense of that well-known leader of education.

We can hardly hope as yet that civil service reform is fully established in the United States. There is, therefore, a fatal defect in any congressional bill to establish a university, so long as the principles of appointment to United States offices, and the tenure of those offices, remain what they now are. A teacher should hold office through good behavior and competency, and it is only upon these conditions that competent professors can be secured for our colleges and universities. Permanence of tenure is necessary to make the position of a teacher one of dignity and independence; and young men of vigor will not enter a profession which offers no money prizes, unless they are induced by stability and peacefulness, and by the social consideration which attaches to it.

The government of a national university would necessarily be in the hands of some board of officers, and the constitution of such a board would lead to many difficulties. If the principle of local representation were to be applied, one would infer that the interests of Maine and Oregon, Minnesota and Florida, must necessarily be different, whereas philology, history, philosophy, science, and mathematics are the same in Massachusetts and Cali-